RocketPort® ISA
Hardware Installation

Introduction

This *Hardware Installation* document discusses the following information:

- Product overview
- RocketPort terminology
- Before installing the hardware
- Installing the hardware
- Interface overview
- Interface connectors and building loopback plugs
  - DB9
  - DB25
  - RJ45 or RJ11
- Setting ISA DIP switches
- Hardware specifications
- FCC notices
- Troubleshooting and creating diagnostics
- Contacting Technical Support

Product Overview

The RocketPort ISA series multiport serial card fits into the ISA or EISA slot of a personal computer, and uses a 36 MHz processor specifically designed to process asynchronous serial communications.

The RocketPort ISA series uses Application Specific Integrated Circuits (ASICs) technology to replace most hardware components, including:

- The processor
- Serial controller
- Bus interface logic and other miscellaneous logic

To eliminate memory mapping conflicts, the RocketPort ISA series is I/O mapped.

This *Hardware Installation* document discusses the following RocketPort ISA-bus serial controllers:

Name	Ports	Interface Type
4*	4	Requires one 4-port interface box.
4J	4	This model has four male RJ45 jacks on the mounting bracket. Cables are not included.
Quadcable*	4	Includes a fanout cable with standard DB25 or DB9 connectors.
8**	8	Requires one 8-port interface box.
8J	8	This model has eight male RJ11 jacks on the mounting bracket. The 8J does not support NT RAS, as it lacks the full set of modem control lines. Cables are not included.
Octacable	8	Includes a fanout cable with standard DB25, DB9, or RJ45 connectors.
16**	16	Requires one 16-port DB25 connector interface box, or one RM16-RJ45 Rack Mount interface box.
32**	32	Requires two 16-port DB25 interface boxes, or two 16-port RM16-RJ45 Rack Mount interface boxes, or one RM32-RJ45 Rack Mount interface box.

* *Some 4-port models have the capability to be 8-port cards with an 8-port interface. Some drivers view the 4-port as an 8-port card.*

** *For interface information, see the* RocketPort Interface Overview *discussion.*

All RocketPort ISA series interfaces support RS-232. There are also models available that support RS-422. You can install up to four RocketPort ISA cards in one PC, for a total of 128 additional serial ports, and you can install a combination of PCI-bus and ISA-bus RocketPort cards.

For driver installation, see the *software installation and configuration* documentation or the driver **readme** file for your operating system.

Note: *Red underlined text denotes URL jumps.*

RocketPort Terminology

For the purposes of the following discussions, these products are referred to as "RocketPort ISA" cards:

- RocketPort ISA-bus boards (any interface type including 4J, 8J, Quadcable, and Octacable)
- RocketPort 485

These products are referred to as "RocketPort PCI" cards:

- RocketPort PCI-bus boards (any interface type including 4J, Quadcable, and Octacable)
- RocketPort *Plus*
- RocketPort PCI *422*

Before Installing the Hardware

Read this subsection:

- *If* you already have one or more RocketPort ISA cards installed in your system.
- *If* you plan to install a combination of RocketPort ISA and RocketPort PCI cards at this time.

Installing Both RocketPort ISA and PCI Cards:
You must complete installation of all RocketPort PCI cards before beginning to install any RocketPort ISA cards.

Explanation:
I/O addressing for RocketPort PCI cards is handled automatically by the computer's BIOS when you first power up the computer after installing the cards.

I/O addresses for RocketPort ISA cards are set manually using DIP switches on the card. If you install an ISA card *before* installing a RocketPort PCI card, the ISA card addressing may interfere with the computer's ability to recognize the RocketPort PCI card which may prevent the PCI card from functioning properly.

Additional Considerations:
If you are mixing RocketPort ISA and PCI cards, set the DIP switches on the ISA cards so that the first ISA card that you install is the "first" card for I/O addressing purposes, even if it is physically the second, third, or fourth card that you install. See the *Setting the DIP Switches* discussion for switch information.

Installing the RocketPort Hardware

Hardware installation consists of:

- Configuring I/O addresses
- Installing the card in the system.
- Connecting the peripherals.

Note: *After installing the hardware, you must install the device driver for your operating system.*

Use the following procedure to install the card.

1. If required, change the DIP switches (default is 180 hexadecimal) on the card to the desired settings. See the *Setting the DIP Switches* discussion towards the end of this *Hardware Installation* document.

Note: *If you are installing PCI and ISA RocketPort cards, install the PCI cards and driver before installing and configuring the ISA cards. See the software installation and configuration documentation or the driver* ***readme*** *file for information.*

2. Turn off your computer.
3. Remove the system cover.
4. Select an ISA or EISA expansion slot.

Note: *RocketPort ISA can be installed in an ISA or EISA slot. They are available on the Comtrol Software and Documentation CD or at the Comtrol Web site ftp://ftp.comtrol.com/rport/eisa_cfg/ directory.*

5. Remove the slot cover.

Note: *You may want to write down the model number and serial number of the card before installation.*

6. Insert the card into the slot, seating it securely.
7. Reinstall the expansion slot retaining screw.

Note: *You may want to leave the system unit cover off until the driver is installed and running, in case you need to experiment with DIP switch settings.*

8. Attach the interface that came with your card using the appropriate procedure:

   If installing a Quad/Octacable:

   a. Attach the male end of the Quadcable or Octacable to the card.

   b. Tighten the retaining screws.

   Note: *Quad and Octacable models support RS-232 exclusively.*

   c. Go to Step 9 to complete the installation.

If installing a standard interface box:

a. Attach the male end of the RocketPort cable to the card and the female end to the connector labeled ***Host*** on the interface box.

Note: *The male DB25 port labeled Host is reserved for Comtrol use and no user accessible signals are present at this port.*

b. Tighten the retaining screws.

Note: *If you have a RocketPort 32, the connector labeled J1 corresponds to Ports 0—15 and the connector labeled J2 (closest to the bus) corresponds to Ports 16—31.*

c. If applicable, use the slide switches on the interface box to set each port to either RS-232 or RS-422.

d. Go to Step 9 to complete the installation.

If installing a rack mount interface box:

The RM16-RJ45 and RM32-RJ45 are sturdy enough to allow you to stack several units on a shelf, or you can mount it directly into a rack.

Make sure that you have installed the RocketPort card or cards before connecting a rack mount interface.

a. Optionally:

- place the unit on a stable surface, or
- attach the L brackets to the interface using the screws supplied with the unit, and attach the L bracket into your rack

Note: *You can mount the unit facing in either direction.*

b. Optionally, for the RM16-RJ45, attach the 10-foot cable to the RM16-RJ45 interface or 3-foot cable to the RocketPort card, or attach the 3-foot and 10-foot cables together.

Note: *The cables are interchangeable. You may connect either or both cables depending upon the distance between the card and the rack. The maximum distance permitted between the interface box and card is 15 feet.*

c. Optionally, for the RM32-RJ45, attach the two cables to the card and the interface. The connector labeled J1 corresponds to Host A (Ports 0 - 15), and the connector labeled J2 (closest to the bus) corresponds to Host B (Ports 16 - 32).

Caution *Do **not** connect 16-port adapters located in different machines to the RM32-RJ45. It is possible to damage the interface and adapter card if the interface is connected to two PCs using separate line power sources.*

9. Connect your peripheral devices.

10. Use the *software installation and configuration* documentation or device driver **readme** file to install the driver to complete your installation.

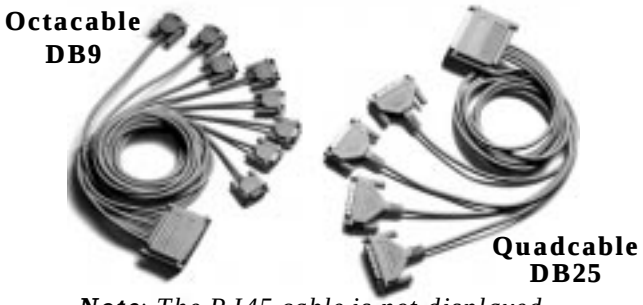
Note: *If installing on an EISA machine, you may need the EISACFG files.*

RocketPort Interface Overview

The RocketPort series provides several interface options:

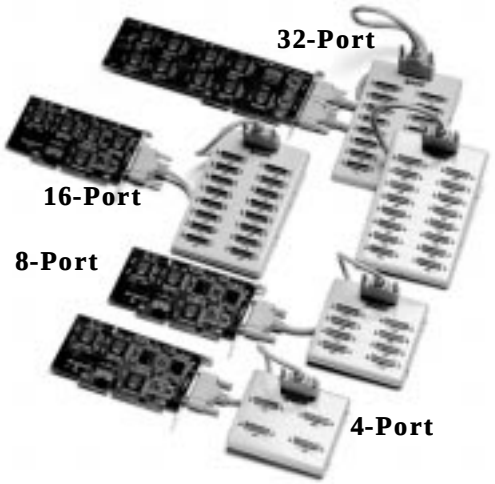
Note: *The ISA-only RocketPort 8J does not support NT RAS, as it lacks the full set of modem control lines.*

- Quadcable and Octacable fanout cables, which are available with the following configurations:
  - Quadcable DB25 and DB9.
  - Octacable DB25, DB9, and RJ45.



Note*: The RJ45 cable is not displayed.*

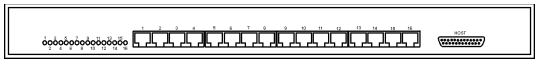
- Standard interface boxes are available in several configurations:
  - RS-232 mode-only or switch-selectable RS-232/422; both models have female DB25 connectors.
  - Surge interface box that is switch-selectable RS-232/422 with male DB25 connectors



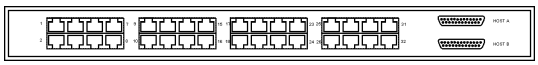
Note: *RS-422 supports up to 10 multidrop devices.*

- Rack Mount Models are available with RJ45 connectors (back panels shown).
  - 16 Port RS-232

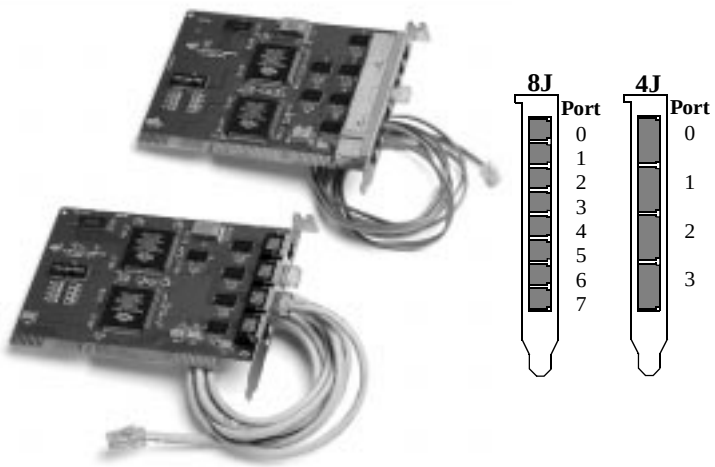
- 16 Port RS-422



- 32 Port RS-232 with status LEDs. The yellow LEDs show receiving activity. The green LEDs show transmitting activity.



- RocketPort 4J (RJ45) or 8J (RJ11):

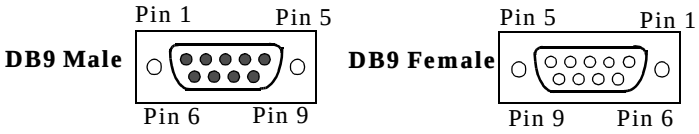


DB9 Interface Connectors

There are Quadcable and Octacable models available with DB9 connectors on a fanout cable.

DB9 Pinouts

Use this table and figure for information about the DB9 connectors used on the Quadcable and Octacable.



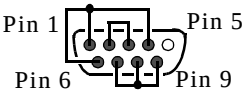
Pin	DB9M RS-232 Signal
1	CD
2	RxD
3	TxD
4	DTR
5	Signal GND
6	DSR
7	RTS
8	CTS
9	Not Used

Building DB9 Female Loopback Plugs

Loopback plugs are used with the diagnostics to test serial ports.

This loopback is used with the Quadcable and Octacable. Wire the following pins together:

- Pins 1 to 4 to 6
- Pins 2 to 3
- Pins 7 to 8 to 9



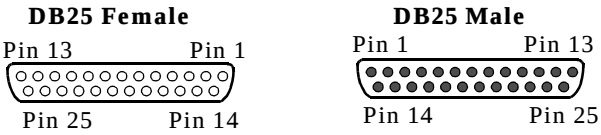
RS-232 (Back View)

DB25 Interfaces

Use the following subsections for DB25 interface connectors. Standard interface boxes use female DB25 connectors, while the Surge interface box, Quadcable, and Octacable fanouts use male connectors.

DB25 Pinouts

The following figures and table illustrate connector information for DB25 connectors.

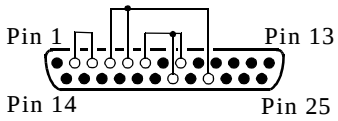


Pin	RS-232 Signal	RS-422 Signal
1	Not used	Not used
2	TxD	Not used*
3	RxD	Not used*
4	RTS	Not used*
5	CTS	Not used*
6	DSR	Not used*
7	Signal ground	Signal ground*
8	DCD	Not used*
9 to 14	Not used	Not used
15	Not used	RxD+
16	Not used	Not used
17	Not used	RxD-
18	Not used	Not used
19	Not used	TxD+
20	DTR	Not used*
21 to 24	Not used	Not used
25	Not used	TxD-

* *All RS-232 signals are present in RS-422 mode. The Quad/Octacables do not support RS-422 mode.*

Building DB25 Female Loopback Plugs

Loopback plugs are used with the diagnostics to test serial ports.

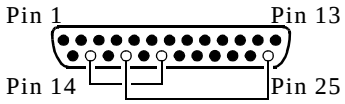


RS-232 Only (Back View)

This loopback is used with Quadcable, Octacable, and the Surge interface boxes. Wire the following pins together for an RS-232 plug.

- Pins 2 to 3
- Pins 4 to 5 to 22
- Pins 6 to 8 to 20

Wire the following pins together for an RS-422 loopback plug (Surge interface box).

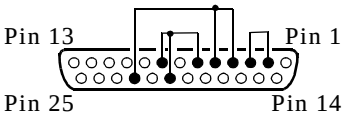


RS-422 Only (Back View)

- Pins 15 to 19
- Pins 17 to 25

Building DB25 Male Loopback Plugs

Loopback plugs are used with the diagnostics to test serial ports.

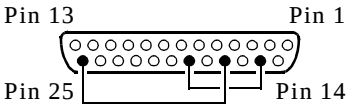


RS-232 Only (Back View)

This loopback plug is used with the standard 8- and 16-port DB25 interface boxes.

- Pins 2 to 3
- Pins 4 to 5 to 22
- Pins 6 to 8 to 20

Wire the following pins together for an RS-422 loopback plug.



RS-422 Only (Back View)

- Pins 15 to 19
- Pins 17 to 25

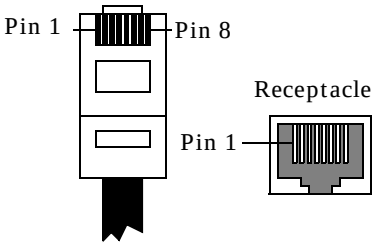
RJ Interfaces

The RocketPort 4J, an Octacable model, and the Rack mount interface box use RJ45 connectors. The RocketPort 8J uses an RJ11 connector.

RJ Pinouts

Use the following table and figures for pinout information on the RJ connectors used on the 4J, 8J, Octacable, and Rack Mount interface boxes.

RJ45



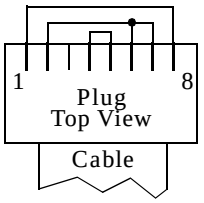
Pin	RJ45 RS-232	RJ45 RS-422	RJ11
1	RTS	TxD+	DTR
2	DTR	Not Used	Signal Ground
3	Signal Ground	Not Used*	TxD
4	TxD	TxD-	RxD
5	RxD	RxD-	DCD
6	DCD	Not Used	CTS
7	DSR	Not Used	N/A
8	CTS	RxD+	N/A

* *Pin 3 is tied to ground on the card, but it is not used in the cable.*

Note: *RJ11 connectors are standard telephone cables. They appear similar to RJ45, but only have 6 pins.*

Building RJ45/RJ11 Loopback Plugs

Loopback plugs are used with the diagnostics to test serial ports.



This RJ45 loopback is used with the 4J, Octacable, and Rack Mount interfaces.

- Pins 4 to 5
- Pins 1 to 8
- Pins 2 to 6 to 7

The 8J uses an RJ11 loopback, which looks similar but has this pin wiring:

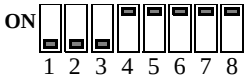
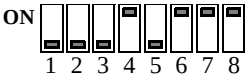
- Pins 3 to 4
- Pins 1 to 5 to 6

Setting the DIP Switches

The RocketPort ISA card uses a DIP switch to set the base I/O address range. The default value is 180 (hex). If you are installing more than one RocketPort card, or if you experience an I/O address conflict with another device, use the DIP switches to change the I/O address.

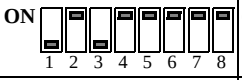
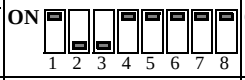
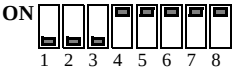
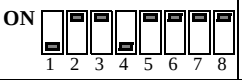
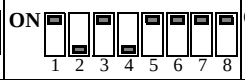
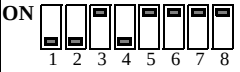
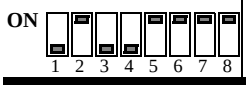
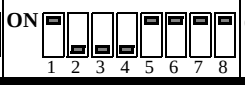
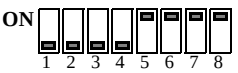
For example, if you install two RocketPort cards and are using the default address range:

Sample DIP Switch Settings

1st RocketPort 180 (hex)	 1st Card
2nd RocketPort (Software address can be any unused I/O address)	 2nd Card

The following table lists possible DIP switch settings. We recommend starting with the default settings and making changes only if the default values produce conflicts.

First ISA Card DIP Switch Settings (see Notes)

100 - 143 hex 	140 - 183 hex 	180 - 1C3 hex 
200 - 243 hex 	240 - 283 hex 	280 - 2C3 hex 
300 - 343 hex 	340 - 383 hex 	380 - 3C3 hex 

Notes:

1. *If installing a single RocketPort ISA card, set the DIP switches as shown in the table.*
2. *If installing two ISA cards, set the DIP switches on the second card the same as the switches on the first card, EXCEPT SWITCH 5 OFF.*
3. *If installing three ISA cards, follow Note 2 for the second card, then set the DIP switches on the third card the same as the switches on the first card, EXCEPT SWITCH 6 OFF.*
4. *If installing four ISA cards, follow Notes 2 and 3 for the second and third cards, then set the DIP switches on the fourth card the same as on the first card, EXCEPT SWITCHES 5 AND 6 OFF.*

Specifications

The following tables illustrate RocketPort conditions and specifications.

Environmental Condition	Value
Air temperature: System on System off	 0 to 40ºC -20 to 85ºC
Humidity (non-condensing): System on System off	 8% to 80% 20% to 80%
Altitude	0 to 10,000 feet

Electromagnetic Compliance	Status
Emission: Canadian EMC requirements CISPR-22/EN55022 Class A FCC PART 15: Class A	Yes
Immunity: EN50082: 801-2 ESD, 801-3 RF, 801-4 FT	Yes
UL Recognized	Yes

RocketPort ISA Card	Specification
Baud rate: RS-232 DTE (4J, Quad/ Octacable models) RS-232/422 (models with interface box)	 50 to 460.8K baud (without interface box) 50 to 230.4K baud (with interface box)
Note: *Baud rate is dependent upon hardware and operating system configuration.*	
Bus interface	ISA
Note: *EISA files are on the FTP site or Comtrol CD.*	
Control by device driver: Data bits Parity Stop bits	 7 or 8 Odd, Even, None 1 or 2

Current consumption:	+5V	+12V	-12V
RocketPort 4	700 mA	65 mA	80 mA
4J/8J/Quad/Octacable	350 mA	100 mA	160 mA
RocketPort 8	700 mA	105 mA	115 mA
RocketPort 16	950 mA	210 mA	330 mA
32-Port	1.9 A	420 mA	660 mA

Dimensions: 4J/8J/Quad/Octacable 4/8/16-Port 32-Port	 6.25” by 4.2” 8.1” by 4.2” 13” by 4.2”
Heat output: 4/8-Port 4J/8J/Quad/Octacable 16-Port 32-Port	 17.9 BTU/Hr 16.6 BTU/Hr 26.6 BTU/Hr 53.3 BTU/Hr

RocketPort ISA Card	Specification
Note: *Interface heat output is approximately 25% of this total.*	
I/O ports/expansion slot	From 4 to 32
Interfaces: All models With optional switch-selectable interface box	 RS-232 RS-422
Interrupt (*software selectable*)	None, 3, 4, 5, 9, 10, 11, 12, 15
Mean time between failures (MTBF): 4-Port, 8-Port 4J Quad/Octacable 8J 16-Port (Standard) 16-Port (Rack) 32-Port	 78.5 Years 85.3 Years 28.8 Years 84.4 Years 56.4 Years 42.8 Years 33.6 Years
RocketPort cards/system	4
Surge protection with standard and rack mount interface boxes	Provides ESD surge protection exceeding 10 KV.
Surge protection with Surge interface box	Meets standard EIA-232-E and provides ESD surge protection exceeding 25 KV.

Surge Interface Box Operating Specifications

Description	Limit
Maximum surge current (8x20*u*S)	100 amps (total)
Capacitance	<350pf
Clamping voltage	30 volts
Clamping response time	<5 nanoseconds
Transient energy (10/1000 MS)	300 mJ
Inductance	<1.5 nh
ESD withstand (surge-protection)	25KV

Interface Box Type	Mounting Dimensions	Overall Dimensions
RS-232 only, 8-Port	3.2” x 6.48”	5.8” x 5.35” x 0.65”
RS-232 only, 16-Port	3.0” x 6.17”	5.8” x 8.5” x 0.65”
RS-232 16-Port (Rack Mount)	19” x 1.74” x 8.0” (with brackets)	16.75” x 1.74” x 8.0” (without brackets)
RS-422 16-Port (Rack Mount)	19” x 1.74” x 8.0” (with brackets)	17.25” x 1.74” x 8.0” (without brackets)
RS-232 32-Port (Rack Mount)	19” x 1.74” x 8.0” (with brackets)	17.25” x 1.74” x 8.0” (without brackets)
RS-232/422, 4-Port	3.2” x 6.48”	5.8” x 5.35” x 0.65”
RS-232/422, 8-Port (All models)	3.2” x 6.48”	5.8” x 5.35” x 0.65”
RS-232/422, 16-Port (All Models)	3.0” x 6.48”	5.8” x 8.5” x 0.65”

FCC Notices

Radio Frequency Interference (RFI) (FCC 15.105)
This equipment has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)
This equipment complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)
Changes or modifications to this equipment not expressly approved by Comtrol Corporation may void the user's authority to operate this equipment.

Serial Cables (FCC 15.27)
This equipment is certified for Class A operation when used with shielded cables.

Troubleshooting and Running Diagnostics

The first step to troubleshooting a problem is to determine that your RocketPort is functioning properly. To do so, you can create a bootable diskette.

You need two files to create a bootable floppy diagnostic diskette:

- The **Rawrite** utility that creates a bootable diagnostics diskette
- The diskette image file (*.i).

You can find both files on the *Comtrol Software and Documentation CD* or download them from the ftp site.

Note: *If you have the* Comtrol Software and Documentation CD, *you can use the* Quick Start Card *for procedures for your operating system.*

Creating a Bootable Diagnostics Diskette

This discussion outlines how to create a bootable diagnostics diskette. You can use our Web site ftp://ftp.comtrol.com/bootdiag.htm to:

- Download the necessary files.
- Easily find specific procedures for your operating system to create the bootable diskette.

Diagnostics Overview

After you create a bootable diagnostic diskette, you can use the diagnostic program to:

- Confirm that the hardware is functioning.
- Determine resolutions to conflicts during installation.
- Provide you with the ability to stress test the cards.

For example, you may want to run the diagnostics overnight to evaluate a possible problem. You will need loopback plugs for each port that you want to stress test. If you need additional loopback plugs, you can use the appropriate *Building Loopback Plugs* discussion in this document to build additional loopback plugs.

Running the Diagnostics

You can run the diagnostics using one of the following methods:

- Execute the **rocket.exe** file on the diskette in a native DOS environment.

Note: *The diagnostic occasionally fails when running in Windows MS-DOS® windows.*

- Boot the system from diagnostics diskette you created.

Use the following procedure to run the diagnostics:

1. Restart your machine in DOS mode or insert the diagnostics diskette.
2. Execute **rocket.exe** or start the machine.
   The diagnostic starts automatically,
3. Enter the appropriate letter for the base I/O range and IRQ used for the first card.

   Note: *Only the first card requires that the I/O address matches the physical DIP switch setting. For each subsequent card, select any unused I/O address available in your system.*
4. Follow the remainder of the on-line instructions.

If the diagnostics did not pass you may want to use the following discussion to diagnose your problem.

Resolving Failures

If the diagnostics could not find the card:

- Make sure that you have entered the correct I/O base address and IRQ.
- Select a different unused I/O address (also reset the DIP switch to the new selection).
- Turn off the power and reseat the card into the slot.
- Check for proper cable connections.
- Check for proper installation of the loopback plug.

Try running the diagnostics again. If they fail again, you may have a bad port. *Contact Technical Support*.

Technical Support

Comtrol has a staff of support technicians available to help you. Before you call, please have the following information available:

Item	Your System Information
Model number	
Serial number	
Interface type	
I/O address and IRQ	
Operating system type and release	
Device driver version	
PC make, model, and speed	
List other devices in the PC and their addresses	

Comtrol	Headquarters	Europe
Phone	(763) 494-4100	+44 (0)1869 323220
FAX	(763) 494-4199	+44 (0)1869 323211
E-mail	support@comtrol.com	support@comtrol.co.uk
Web support	Searchable Solution Database and FAQs	
Web site	www.comtrol.com	www.comtrol.co.uk
FTP site	ftp.comtrol.com	

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